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MONTHLY REPORT - SEPTEMBER 1982

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HONOLULU LABORATORY
LA JOLLA LABORATORY
TIBURON LABORATORY
PACIFIC ENVIRONMENTAL GROUP

MONTHLY REPORT - SEPTEMBER 1982

STATUS OF PUBLICATIONS

Mackas, D.L. and R.W. Owen. 1982. Temporal and spatial resolution of pump sampling systems. Deep-Sea Res. 29(7a):883-892.

A simple empirical method is described for determining the fine scale resolution of continuous flow-through sampling systems. An input delta function is provided by injection of fluorescent dye into the sampler intake. The output fluorescent signal provides time-domain estimates of delay and signal spread; Fourier transformation of the output provides the frequency domain transfer function of the system. Systems with direct intakes (hose or through-hull fitting) can resolve features of 30-s duration or less; however, sea chest intakes cause substantial blurring of the input signal. Attempts to increase vertical spatial resolution by slow lowering rates can result in profiles characterized by apparent micropatchiness and multiple layering, artifacts of the procedure.

Squire, James L. 1982. Catch temperatures for some important marine species off California. NOAA Tech. Rep. NMFS SSRF 759, 19pp.

Airborne sea surface temperatures surveys using infrared techniques were conducted monthly off the central and southern California coast, 1963 through 1968, by the National Marine Fisheries Service in cooperation with the U.S. Coast Guard. The resulting temperature data were matched to commercial sportfishing boat catch data to determine the relationship between catch and temperature for the following major sport species: chinook and silver salmon, Oncorhynchus tshawytscha and O. kisutch; yellowtail, Seriola dorsalis; Pacific bonito, Sarda chiliensis; Pacific barracuda, Sphyraena argentea; white seabass, Atractoscion nobilis; and albacore, Thunnus alalunga.

THIS REPORT DOES NOT CONSTITUTE PUBLICATION AND IS FOR INFORMATION ONLY.

Part I presents graphs for each of the above species for areas having high catches, the month during which most fish were caught, sea surface temperature at which most fish were caught, mean catch temperature and its standard deviation, and temperature range.

Part II describes how catch and catch-per-unit-effort (CPUE) are related to temperature. A series of weekly airborne temperature surveys were flown over a high catch rate area off San Diego, California, April through October, in 1972, 1973, and 1974. These temperature data were compared with catches of yellowtail, Pacific barracuda, and Pacific bonito by the sportfishing fleet within the survey area. Graphical Kolmogorov-Smirnov cumulative preference curves of catch versus temperature for yellowtail, Pacific barracuda, and Pacific bonito show increased catch rates through the midrange temperatures 17.8° to 20.0°C (64° to 68°F) with a reduction in rates above 20.5°C (69°F).

For a 31-wk period starting 1 April 1972, 1973, and 1974, the temperature at the 20th percentile of the catch temperature curve was slightly above the 20th percentile of the cumulative temperature curve, indicating that fewer fish were taken at the very lowest temperatures; otherwise, catch for the three species appears representative of the temperature distribution. The average yearly temperature for large catches of Pacific barracuda, yellowtail, and Pacific bonito (30% or more above mean) fluctuated from 16.2°C (61.2°F) to 23.0°C (73.5°F), with a mean value of 19.5°C (67.1°F) for Pacific barracuda, 18.5°C (65.4°F) for yellowtail, and 19.6°C (67.4°F) for Pacific bonito. Nonparametric rank correlation tests (Spearman and Kendall) for catch and CPUE versus temperature showed consistently higher correlations for catch than for CPUE, indicating an increase in effort with increasing catch. In analyses of temperature and CPUE by species and year for 12-, 17-, and 31-wk periods, about one-half of the individual cases tested were, on the average, statistically significant at the .05 level.

Temperature distributions within 20th percentile ranges of the cumulative CPUE curves obtained for the three species combined indicate that the lowest temperature range, 12.7° to 15.5°C (55° to 60°F), is the only area where catch rates were lower than expected.

There is little evidence for a preferred temperature within the range of 15.5° to 21.1°C (60° to 70°F). Conclusions from this study indicate that fishery data are by no means optimal for examining the hypothesis of preferred temperature, due to confounding of cause and effect between catch and effort. Lack of simultaneous observation of the spatial distribution of species and environmental measurements over the extent of distribution over time are limiting factors in determining the true relationship of species to the environmental factor of sea surface temperature.

Administrative Reports

Honolulu Laboratory

Cooper, James C., and Samuel G. Pooley. 1982. Total seafood volume in Hawaii's wholesale fish markets. SWFC Admin. Rep. H-82-15.

Shippen, Nathaniel T. 1982. Seamount fishery, foreign vessel observer report, Aso Maru (July 17-August 10, 1982). SWFC Admin. Rep. H-82-16.

Translation

Suisan Sekai. 1981. Taiwan sends 79 vessels to gill net for squid in Emperor Seamount grounds (Taiwan gyosen no dōkō. Ika nagashi-amiryō ni 79-seki ga shutsugyō. O-nigiwai no Tenno-zan gyojō). Suisan Sekai 30(9):55. (Engl. transl. by Tamio Otsu, 1982, 3 p., Transl. No. 71; available Southwest Fish. Cent., Natl. Mar. Fish. Serv., NOAA, Honolulu, Hawaii 96812).

Tiburon Laboratory

Smith, Susan E. 1982. NOAA's Fishery Research Laboratory at Tiburon: History of the Site and Present Activities. SWFC Admin. Rep. T-82-01.

Approved by Center Director

Harrison, Craig S., Thomas S. Hida, and Michael P. Seki. The diet of the red-footed booby (Sula sula) on Rose Atoll, Samoa. Auk.

Kullenberg, G., R. Owen, E. Buch and Chr. Eilertsen. Tracing internal layers of plankton. For consideration for publication in ICES Rapp. Proc. Verb.

Oliver, C.W., G.J. Walker, and R.B. Miller. Time/area distribution and composition of the incidental kill of small cetaceans in the U.S. purse-seine fishery for tuna in the eastern tropical Pacific during 1981. For consideration for publication in the 33rd Annual Report of the International Whaling Commission.

Shomura, Richard S., and Walter M. Matsumoto. Structured flotsam as fish aggregating devices. NOAA Tech. Memo. NMFS, NOAA-TM-NMFS-SWFC-22.

Walker, Michael M. A conditioned response for use in magnetic sensory discrimination studies in yellowfin tuna, Thunnus albacares. (Abstr.) Tenth Annual Conference of the International Marine Animal Trainers Association (IMATA), October 25-29, 1982, Honolulu, Hawaii.

HONOLULU LABORATORY

INSULAR RESOURCES INVESTIGATION

Ocean Thermal Energy Conversion Meeting Held

Richard N. Uchida, Leader, Insular Ecosystem Study Task, assisted Laboratory Director Richard S. Shomura in planning and organizing an ocean thermal energy conversion (OTEC) meeting at the Honolulu Laboratory between NOAA officials and representatives of the Hawaii State Government, University of Hawaii (UH), and the private sector in Hawaii. Included in the team from NOAA were Drs. Edward Myers of the Office of Ocean Minerals and Energy, Dean Parsons of the National Marine Fisheries Service (NMFS) Office of Habitat Protection, and Don Hoss and Dave Peters from the NMFS Beaufort Laboratory in North Carolina. Research assistant Michael P. Seki was rapporteur for the meeting. Sitting in on the meeting was Dr. Lamarr Trott, Deputy Director of the NMFS Office of Science and Environment, who is currently on an Intergovernmental Personnel Act assignment at the UH.

The NOAA personnel briefed the Hawaii State officials, scientists, and industry representatives on NOAA's environmental assessment program relative to OTEC development. They were, in turn, briefed by the Hawaiian contingent on OTEC developmental research and other activities in Hawaii.

Uchida reported that 22 people attended the meeting and all segments of the OTEC community in Hawaii were well represented. A summary report of the meeting is being prepared by Seki.

As part of the Honolulu Laboratory's OTEC input, Uchida is preparing a report, "Summary of pertinent biological characteristics of potential ocean thermal energy conversion (OTEC) sites in the Pacific."

Undersea Observations Planned

Richard Uchida, Leader of the Insular Ecosystems Task, convened a meeting of an ad hoc committee to develop a project proposal involving subsurface observations from the Hawaii Undersea Research Laboratory's (HURL) submersible, Makalii, at French Frigate Shoals and Necker Island in June 1983. Included in the committee were statistician Dr. Jeffrey Polovina, and fishery biologists Dr. Stephen Ralston, Robert A. Skillman and Reginald M. Gooding. A proposal was completed and submitted to the Director's office for approval.

A preliminary report on the series of dives made earlier by Gooding and Dr. Ralston from the Makalii was also completed.

Preparation of Manuscripts Based on Field Work in the NWHI Continues

Researchers in the Insular Ecosystem Study Task continued the preparation of manuscripts based on field work completed in the Northwestern Hawaiian Islands (NWHI). Following comments made by outside reviewers, Reginald Gooding, Fishery Biologist, revised his manuscript, "Predation on released spiny lobster, Panulirus marginatus, during tests in the Northwestern Hawaiian Islands." Gooding also completed a draft manuscript, "The effect of lobster offal on spiny lobster, Panulirus marginatus, trap catches in the Northwestern Hawaiian Islands." This manuscript will be temporarily held in abeyance until additional experiments are completed on a forthcoming cruise (82-05) of the NOAA research vessel Townsend Cromwell.

Research assistants Robert L. Humphreys, Jr., and Steven H. Kramer continued work on the revision of their manuscript, "Ciguatera and the feeding habits of the greater amberjack, Seriola dumerili, in the Hawaiian Archipelago." Many of the tables and figures were revised to enhance the clarity of the data. Kramer also completed and submitted to the editor of Pacific Science, a note on the capture of a new species of hagfish from the NWHI, and continued work on a manuscript of the food habits of wahoo, Acanthocybium solandri.

Research assistants Alan R. Everson and Bert S. Kikkawa worked on a draft of a manuscript on the maturation and fecundity of the greater amberjack. Included in the manuscript will be an analysis of the relationship of ciguatoxicity with the stage of sexual maturity in the species.

James H. Uchiyama, Fishery Biologist, revised his manuscript on the age and growth of the principal species caught by handlines in the NWHI.

Trolling Data Analysis Completed

Research Assistant James H. Prescott and fishery biologist James Uchiyama completed an analysis of trolling data collected in the Northwestern Hawaiian Islands. Catch, effort, and catch-per-unit-effort were determined by cruise, banks, species within cruises and banks, species within cruises, and cruises within banks. The analysis was restricted to a data set that included direct trolling on defined banks. The approximate sample size (days trolled) required to detect a difference in the mean catch rate between feather and jethead lures was also determined.

Uchiyama also reviewed a manuscript, "Aspect of the biology of the greater amberjack, Seriola dumerili, off southeastern Florida," by R. King Burch, who is presently working at the Waikiki Aquarium under contract with the UH Sea Grant Program.

First Series of Resource Assessment Cruises in the Mariana Archipelago Completed

Dr. Jeffrey Polovina, Leader, Resource Assessment Investigation of the Mariana Archipelago (RAIOMA) Task, reports that the NOAA research vessel Townsend Cromwell returned to Honolulu on September 20, 1982, after spending approximately 6 months in the Mariana Archipelago on a series of four fishery survey and assessment cruises in the area. The first cruise was devoted primarily to a bathymetric survey to better define the potential fishing banks in the area. The following three cruises were designed to identify and assess the fishery resources in the Marianas.

On the final cruise of the series, bottom fishes, deepwater shrimps, and akule were sampled at Pathfinder and Arakane Reefs, "38-fathom" and Esmeralda Banks, Pagan, Saipan, Asuncion, Maug, and Rota Islands. In addition, two unnamed banks, one located 11 miles north of Saipan and the other 90 miles south of Arakane Reef were investigated. Paul M. Shiota, Chief Scientist on the final cruise, reported that the average catch rate for bottom fish during the cruise was 3.2 fish per line-hour; the best daily catch rate of 7.9 fish per line-hour was obtained at Pagan and Maug Islands. The dominant bottom fishes were gindai, Pristipomoides zonatus; yellow-eye opakapaka, P. flavipinnus; and yellowtail kalekale, P. auricilla.

Shrimp traps were fished at depths of 363, 636, and 727 m (200, 350, and 400 fathoms) to determine the vertical distribution of deepwater shrimps, Heterocarpus ensifer and H. laevigatus. The best catch rates were obtained at 636 m (350 fathoms) where the catch for the entire cruise averaged 4.7 kg (10.4 lb) per trap. The best catch rate of 9.4 kg (20.7 lb) per trap was obtained at Pathfinder Reef.

Assisting Shiota on the cruise were research assistants Darryl T. Tagami and Steven Kramer. In addition three researchers from the University of Guam Marine Laboratory, one from the Guam Division of Aquatic and Wildlife Resources, and one member of the Department of Natural Resources, Commonwealth of the Northern Mariana Islands, participated in the cruise.

On the leg returning to Honolulu, the Townsend Cromwell stopped at Lisianski Island in the Northwestern Hawaiian Islands to transport members of the Marine Mammals and Endangered Species Task back to Honolulu. Cooperating scientist Beatrice Burch of the Bernice P. Bishop Museum was Chief Scientist on the leg from Guam to Honolulu.

Bathymetric Chartlets Prepared

Dr. Jeffrey Polovina, Statistician, reports that he and Cdr. Robert C. Roush, Commanding Officer, NOAA research vessel Townsend Cromwell, are preparing a Southwest Fisheries Center Administrative Report, "Chartlets of selected fishing banks and pinnacles in the Mariana Archipelago". These chartlets were prepared by the officers of the Townsend Cromwell and provide new bathymetric detail for 10 banks and pinnacles in the Mariana Archipelago

which are currently being fished or appear to have potential habitats for commercially important marine species, and where the existing bathymetric detail was insufficient for the fisheries assessment work. The bathymetric surveys were conducted over the period April through August 1982 primarily in a depth range of 183-915 m (100-500 fathoms). The survey work was performed by Cdr. Roush, Lts. James D. Sarb, Dean L. Smehil, Gary M. Barome, and Thomas Clark, and Ens. Andrew J. Aldridge.

Although the chartlets are not recommended for use as aids to navigation, they may be useful to fishermen in identifying the extent and contours of valuable fishing grounds.

FISHERY MANAGEMENT RESEARCH PROGRAM

Hawaii Landings of Skipjack Tuna Continue Below Long-Term Average

The September 1982 Hawaii landings of skipjack tuna were estimated at 195.2 metric tons (MT), which is 7.8 MT below the September 1981 landings and 165.0 MT below the 1964-79 long-term average for September. The cumulative landings from January through September were estimated at 1,569.7 MT, which is 371.6 MT below the 1981 landings for the same period and 1,875.0 MT below the 1964-79 long-term average for the same period (Figure 1).

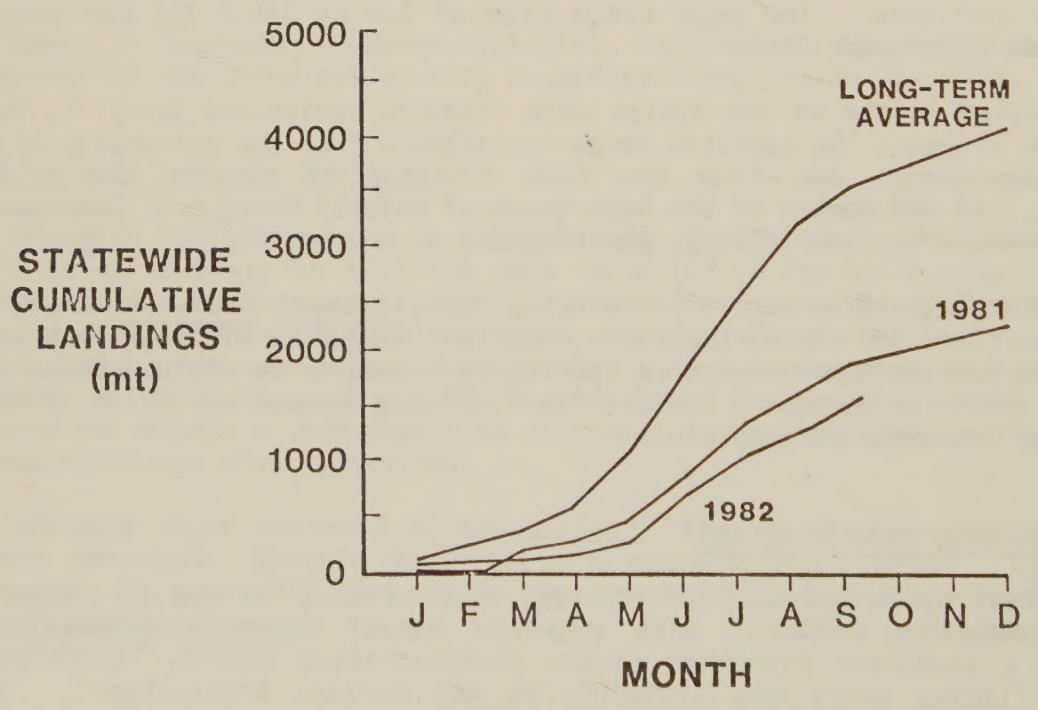


Figure 1.--Cumulative landings in the Hawaiian skipjack tuna fishery.

Number of Fishing Vessels in Hawaii Determined

Dr. R. Skillman, Leader, Fishery Management Research Program, reports that recently, in association with the continued effort by the Western Pacific Regional Fishery Management Council (WPRFMC) to prepare a billfish fishery management plan, a question has arisen regarding whether there has been an increase in domestic fishing effort for billfish over the period 1979-81. Making use of data assembled in the Task's Vessel Inventory Phase I project, Dr. Skillman, Thomas S. Hida, Fishery Biologist, and research assistant Bernard M. Ito summarized the number of vessels documented or registered in the State of Hawaii according to three vessel classes. Tables of these summarized data, presented in a draft Administrative Report, "A note on the number of fishing vessels in Hawaii," document that there has been an 8.1% increase in commercial fishing vessels, an 11.1% increase in charter fishing vessels, and a 2.3% decrease in pleasure vessels. The last vessel category contains an unknown proportion of vessels used for fishing.

Also using the vessel inventory data base, Ito prepared a list of charter fishing vessels for use by the Hawaii Division of Aquatic Resources (HDAR). The HDAR will use these data to study the importance of the State's fish aggregating devices (FAD) program to recreational fishing. The use of FAD's was first introduced and demonstrated in Hawaii by the Honolulu Laboratory.

PELAGIC RESOURCES INVESTIGATION

Researchers at the Kewalo Research Facility Involved in Variety of Activities

Dr. Richard W. Brill, Leader, Experimental Ecology of Tunas Task, reported that researchers at the Kewalo Research Facility were involved in a number of different activities. Michael M. Walker, UH graduate student, continued his behavioral investigations of the magnetic compass sense of yellowfin tuna, Thunnus albacares, and kawakawa, Euthynnus affinis. In addition, Walker is preparing tissue samples for light and electron microscopy to examine the innervation patterns of the suspected magnetic receptor organ.

Research Assistant Martina K.K. Queenth has been testing the trainability of one of the mahimahi, Coryphaena hippurus, that was spawned and reared at the Kewalo Research Facility. This fish has been easily trained to swim through a hoop for a food reward, and it will therefore be possible soon to conduct behavioral tests of this species' ability to detect changes in the earth's magnetic field.

Thomas K. Kazama, Fishery Biologist, and Sharon D. Hendrix, UH graduate student, report that because skipjack tuna, Katsuwonus pelamis, spawning season is over for this year, their work on rearing mahimahi larvae has resumed. Eggs from captive mahimahi are available year-round through cooperative research aggrements with the Oceanic Institute and the Waikiki

Aquarium. There is, therefore, a ready source of well-suited test subjects for research on the effects of environmental conditions on pelagic larval fish survival and growth. Skipjack tuna and mahimahi eggs are also being sent to Sandor Kaupp at the Southwest Fisheries Center's La Jolla Laboratory where the eggs and larvae are being used to test the effects of various levels of ultraviolet light on survival and growth. One skipjack tuna larvae survived for more than 30 days in La Jolla, which for unknown reasons, is better than the spawning project group has been able to do in Hawaii.

Dr. Kim Holland, Hawaii Institute of Marine Biology, is continuing his research on the use of natural and artificial prey odors as attractants for yellowfin tuna. Work with natural prey odors has been almost completed, and the efficacy of artificial odors (mixtures of amino acids) are now being tested.

Finally, Dr. Steve Perry, University of Toronto; Dr. Chuck Daxboeck, Pacific Gamefish Foundation; Dr. Brian Emmett, University of British Columbia; and Dr. Brill have begun a series of experiments on lactate metabolism and acid-base regulation following exhausting exercise in tuna. This project may have important implications with respect to the "burnt tuna" problem which currently reduces the value of an important fraction of the catches of large yellowfin tuna destined for the fresh fish market.

Plans Made for Squid Research Cruises

Walter M. Matsumoto, Fishery Biologist, completed arrangements with the National Ocean Survey's Pacific Marine Center at Seattle, for the installation of two mechanical squid jigging machines on the NOAA research vessel Townsend Cromwell. Matsumoto reports that the installation of the machine and the squid attracting lights are presently in progress and should be completed before the start of the cruise (TC-82-05) in mid-October. As time permits, squid jigging will be conducted at Kanmu and Kinmei Seamounts northwest of Midway, and at each of the island stops on the homeward leg from Midway to Honolulu.

Matsumoto also prepared a preliminary cruise plan for the February 1983 survey of squid resources in Hawaiian waters on the Hokusei Maru. The cruise is the last of the three cruises planned as a joint undertaking between the Southwest Fisheries Center's Honolulu Laboratory and Hokkaido University, Japan. The cruise plan has been approved by the Faculty of Fisheries, Hokkaido University.

In addition, Matsumoto prepared a preliminary cruise plan for a 4-day squid jigging cruise on the Townsend Cromwell (TC-83-01) off Kona and Lanai in January 1983.

DATA MANAGEMENT AND TECHNICAL SERVICES

New Microcomputer Acquired

Fletcher V. Riggs, Leader, Data Management and Technical Services, reports that a new microcomputer has been added to the Honolulu Laboratory's data processing hardware inventory. This system was purchased for use in manipulating and analyzing data down-loaded from large mainframe computers. It is an S-100 bus system with two central processing units (an 8-bit 8085 unit and a 16-bit 8088 unit) and 128-k bytes of random access memory. It has nine serial I/O ports, two 8-inch disk drives capable of storing 1.2-M bytes each, and runs under CP/M or CP/M-86 operating systems (depending upon which processor is being used).

In addition to handling some of the data processing needs of the Fisheries Management Research Program, the system will serve as a "sounding board" and possible prototype of future microcomputer systems of the Honolulu Laboratory. The system may be easily expanded into a multiuser system (which is why it has so many serial I/O ports) with centralized major peripherals such as large hard disk drives and printers. One or more of these systems in this expanded state has the potential for meeting many of the Laboratory's data processing needs.

Steps Taken to Improve Data Inventory and Control

The Staff of the Data Management and Technical Services Task is in the process of implementing a few changes in its normal operating procedures as a first step in efforts to monitor job progress more closely, maintain a data inventory, and improve data security. All batches of data submitted for processing will be accompanied by a form containing several critical pieces of information required for effecting these improvements. Among these pieces of information will be a unique identifier for each batch. A similar system will be used to identify and monitor progress in other types of work requests such as programming and systems development. Although currently completed and handled internally by the Task on a trial basis, these forms will eventually accompany each batch of data or work request when it is received by the Task.

LA JOLLA LABORATORY

Coastal Fisheries Resources Division

COMMERCIAL AND RECREATIONAL FISHERIES RESEARCH FOR MANAGEMENT

Amendments to Anchovy Management Plan in Preparation

Fishery biologist Dr. Richard Methot and Alec MacCall, California Department of Fish and Game biologist at the La Jolla Laboratory, continued preparation of two amendments to the Anchovy Fishery Management Plan. The first amendment proposes to replace the minimum size limit with a minimum mesh size; the second proposes to split the annual quota into two halves and to withhold allocation of the second half if the perceived status of the stock deteriorates substantially from the initial estimate. Dr. Methot presented these amendments to the Anchovy Advisory Subpanel in Long Beach, California on September 23 and to the Pacific Fishery Management Council in Portland, Oregon on September 30. Both groups approved the proposed amendments. The amendments are being modified to incorporate suggestions by the Advisory Subpanel and the Council and will soon be released for public comment.

Anchovy Biomass and Age Compositions Analyzed

Dr. Richard Methot, Fishery Biologist, has been analyzing the biomass and age compositions of the central population of anchovy. The current anchovy biomass is about 25% of the biomass which existed during 1974-75. The decrease in abundance is consistent with an apparent increase in adult mortality rate and is probably not due to decreased recruitment. These preliminary results will be presented at the CalCOFI Conference in October.

Graphs Produced for Stauffer/Picquelle Manuscript

The manuscript "Egg production estimates of spawning biomass of the northern anchovy for 1980 and 1981" by Gary Stauffer, Fishery Biologist at the Northwest andd Alaska Fisheries Center (NWAFC) (formerly of the La Jolla Laboratory) and Susan Picquelle, Statistician at the La Jolla Laboratory, is near completion. Picquelle produced first drafts of the graphs for the paper using a plotting routine on the VAX computer with the assistance of Richard Charter, CalCOFI Data Manager. Picquelle met with Stauffer at the NWAFC in Seattle this month to discuss the graphs and as a result decided to redesign and recalculate many of the plots.

1982 Albacore Physiology Cruise

Scientists from a number of research facilities joined Cruise Leader Dr. Mike Laurs for the 1982 Albacore Physiology Cruise aboard the NOAA research vessel David Starr Jordan. The researchers collected a variety of data, including information on albacore respiration rate, swimming speed, and surface area, as part of their ongoing studies of albacore physiology. Results of the various experiments are now being analyzed.

1. Dr. Jeff Graham of the Scripps Institution of Oceanography and Linda Attaro of the University of California at Los Angeles (UCLA) prepare a respiration tank used to measure the swimming speed and respiration rate of albacore.

2. Dr. Malcolm Gordon, UCLA, records albacore surface area data as Linda Attaro and Dr. Jeff Graham do the measuring chores.

COASTAL EASTERN PACIFIC: POPULATION BIOLOGY OF FISHES

Nutritional Condition of Field-Collected Larvae Examined

As part of an ongoing study to evaluate factors which affect the survival of fish larvae in the sea, fishery biologist Gail Theilacker is determining the growth rate and the incidence of starvation-induced mortality of jack mackerel larvae collected from a 24-square mile area about 200 miles off San Diego, California. Her work addresses two question: 1) how significant is

starvation as a source of larval mortality, and 2) does the density of larvae influence larval growth, i.e., is competition for food regulating growth?

To date, Theilacker has completed the examination of 227 larvae samples, taken from three centrally located stations in which the larval density was high (more than 100 larvae collected per sample) and three peripherally-located stations in which the sample density was low (less than 50 larvae collected). Theilacker is using both histological and morphological criteria that she developed in the laboratory to assess the nutritional condition of the field-collected larvae.

Theilacker previously concluded that histological criteria were more accurate for assessing nutritional condition, but morphological criteria were ultimately preferable because they take much less time to determine and require no special preservation techniques. In the laboratory studies, use of morphological criteria correctly predicted the nutritional condition of 86% of the fish. If this level of predictability can be obtained using field-collected larvae, the technique could provide a quick, timely, and useful indication of mortality of wild fish due to starvation.

To assess the predictability level of the morphometric technique for ocean-caught fish, a multivariate statistical analysis (stepwise discriminant analysis, SWDA) was used in which the histological condition of the ocean-caught fish was the grouping variable. The morphometric technique finds the best combination of larval body measurements and establishes a function using these measurements that will discriminate between larvae of known histological condition; then, given the body measurements of a fish of unknown histological condition, the technique can be used to predict its condition.

Five body measurements were taken on all the ocean-caught fish, and the individual histological condition determined on a sample of fish (n=227) taken from six stations. A SWDA function was obtained using a group of the histologically-graded fish (153 taken from 3 stations; Group 1/Table 1). Predictability was good; 81.5% of the starving fish were correctly classified. But when the function obtained with Group 1 fish was applied to another group of 74 fish, the level of predictability was an unacceptable 55%.

In Group 1, all small (less than 3.5mm) larvae were starving, thus the Group 1 function classified the small, healthy larvae in Group 2 as "starving". A second function was calculated using all the fish in Groups 1 and 2, and this increased the level of predictability for starving larvae to 69%.

Table 1. Morphological classification of field-collected jack mackerel.

Station	Number of larvae Sampled	Analyzed	Histological Condition Starving	Healthy		Percent Correctly classified by SWDA Starving	Healthy
19	43	26	1	25			
20	242	63	25	38			
28	255	58	39	19			
Group 1		153	65	82	(Funct. 1)	81.5	72
23	150	32	1	31			
29	11	11	5	6			
36	36	31	14	17			
Group 2		74	20	54	(Funct. 1)	55	41
TOTAL		227	85	136	(Funct. 2)	69	79

To estimate starvation-related mortality, it is not necessary to allocate larvae into healthy and starved groups exactly, but reasonable estimates of allocation are desirable. For the field samples tested, the morphometric technique misclassified about one-third of the starved larvae. Theilacker does not plan to pursue this analysis further.

Ageing of Juvenile Anchovies Completed

Fishery biologist John Butler and laboratory assistant Susan Longinotti have completed ageing the 1981 juvenile anchovies: the researchers examined growth rings in the otoliths of the anchovies to determine age. This data is presently being analyzed by Butler and Dr. Richard Methot, Fishery Biologist.

Butler and Methot are calculating birthdate distributions for 1978-1981 using length-age keys from each years' data, and length-frequency data from California Department of Fish and Game (CDFG) surveys conducted by Ken Mais of the California Department of Fish and Game.

Anchovy Growth Experiment Initiated

This month, fishery biologists John Butler and Roger Leong began an experiment designed to calibrate otolith development and fish growth. Adult anchovy have been marked externally with silver nitrate and injected with tetracycline. The external marks will allow measurement of individual growth; the tetracycline will deposit in the outer edge of the fish otolith. The

width of the daily increments on the otolith, from the tetracycline mark to the outer edge of the otolith, will be calibrated against fish growth.

Visual Threshold of Feeding Anchovy Larvae Examined

Teodora Bagarinao, Master of Science student at Scripps Institution of Oceanography, and employee of the Aquaculture Department of the Southeast Asian Fisheries Development Center (Iloilo, Philippines) has just completed her thesis research under the direction of Dr. John Hunter, Fishery Biologist at the La Jolla Laboratory. Bagarinao's research revealed the difference in visual sensitivity between 6 mm long northern anchovy larvae and anchovy larvae 10-15 mm in length, and showed a visual feeding threshold and action spectrum for each length class. Bagarinao used the criterion of the incidence of two or more rotifers in the guts of 50% of larvae tested under different spectral irradiances for determination of the feeding threshold.

The threshold sensitivity of 10-15 mm larvae to white light was 0.15 Wcm^{-2}, or 0.61 Lux. Maximum sensitivity of the action spectrum for feeding occurred in the green wave lengths around 530 nm. Anchovy larvae of this size can also feed to a limited extent in the dark when food densities are high; in the dark about 10% of the larvae had 2 or more prey in their stomachs when the density of rotifers was 20-40 rotifers/ml.

Bagarinao found that the visual feeding threshold for anchovy larvae 6 mm in length differed significantly from that of 10-15 mm long larvae. There are no rods in the retina of the smaller larvae, and the larvae's action spectrum has several peaks suggestive of pure cone vision. Rod recruitment begins at about 10 mm, hence the greater visual sensitivity of the larger larvae in feeding can be attributed to the presence of rods. The form of the action spectrum developed by Bagarinao indicates that both rods and cones were used at low light levels to find food.

ECOLOGY AND TAXONOMY OF FISHES OF THE CALIFORNIA CURRENT

Ahlstrom Symposium Preparations Continue

Work continues on the preparation of papers for the upcoming Ahlstrom Memorial Symposium on "The Ontogeny and Systematics of Fishes," to be held at the La Jolla Laboratory, August 15-18, 1983.

Dr. Geoffrey Moser, Program Leader, finished his examination of deep-sea smelt larvae collected by the DANA expeditions, as part of a paper dealing with argentinoid smelts, to be prepared in collaboration with Dr. Daniel Cohen of the Los Angeles County Museum of Natural History.

Biological laboratory technician Betsy Stevens made progress on her review of the larvae of blennioid fishes; she is working in conjunction with Ann Matarese of the Northwest and Alaska Fisheries Center, Seattle, and William Watson of Marine Ecological Consultants.

COASTAL EASTERN PACIFIC FISHERIES ENVIRONMENT INVESTIGATIONS

Visiting Japanese Scientist Reviews Satellite Applications to Fisheries

Dr. Hiroshi Shinomiya, Professor at the Nikon University in Tokyo, Japan, spent 9 weeks at the La Jolla Laboratory of the Southwest Fisheries Center in order to learn the current state of the application of satellite remote sensing to fisheries research. While at the Laboratory, Dr. Shinomiya attended the training class given at the Scripps Remote Sensing Facility (SRSF) and gained experience in processing satellite thermal imagery. Ron Lynn and Dr. Mike Laurs, Oceanographers, provided a review of the satellite studies in progress at the Laboratory and gave him guidance in obtaining background reading. Dr. Paul Fielder, Physical Science Technician, provided assistance in processing imagery at the SRSF. Dr. Shinomiya was able to obtain several images which covered Sagami Bay in Japan. He returned to Japan with a magnetic tape of these images.

Dr. Shinomiya manages the Fisheries Engineering Laboratory of Nikon University where his responsibilities include the mathematical analysis of fisheries phenomena and the engineering methodology of fishing vessel systems as well as the application of remote sensing to fisheries. He will study the relation of the thermal imagery of Sagami Bay to the local fisheries within the Bay.

While he was in the United States, Dr. Shinomiya visited other laboratories involved with remote sensing: National Engineering Laboratory, the Jet Propulsion Laboratory at Pasadena, California, and the National Environmental Satellite Service at Redwood City, California. He also visited the Honolulu Laboratory on his return trip to Japan.

SURVEY SYSTEMS DEVELOPMENT AND EVALUATION

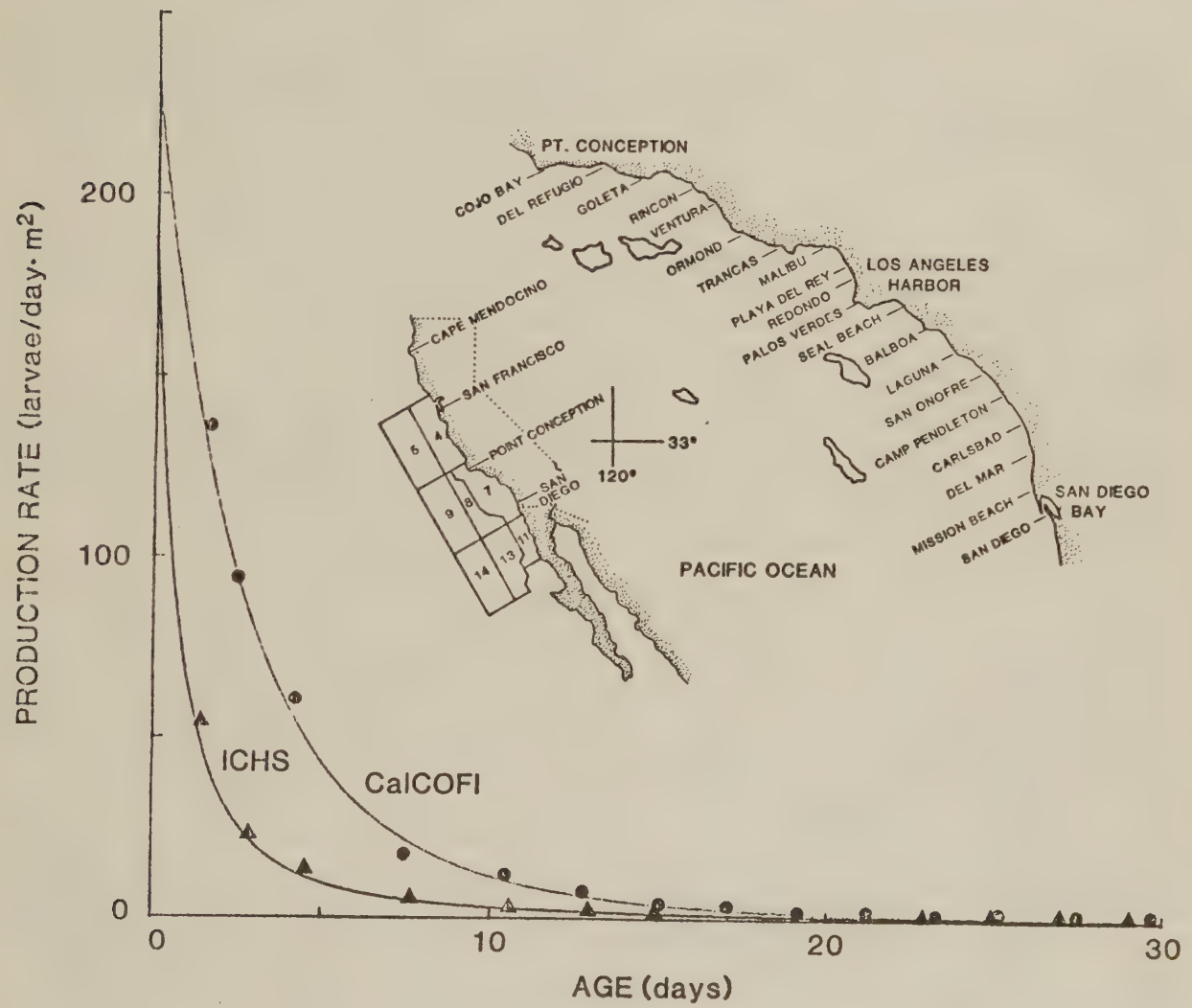
Nearshore Production of Anchovy Raises New Questions

Dr. Roger Hewitt, NOAA Corps, reported that the production and survival of anchovy spawn in the nearshore region (ca. within 3 miles of the coast) was no different than that occurring throughout the Southern California Bight in 1980. This finding casts doubt on the long-standing hypothesis which defines the nearshore region as nursery grounds for pelagic schooling fish such as the anchovy.

Dr. Gary Brewer, University of Southern California, provided stage-specific catches from monthly Ichthyoplankton Coastal and Harbor Studies (ICHS) cruises conducted during 1979 and 1980. Hewitt derived age-specific production estimates by pooling the data over time and adjusting the catches

for growth and sampler bias. Several hazard functions were considered and a simple function was chosen which describes continuously improving survival with age; the resulting production curve was fit to the data.

Nearshore anchovy production was compared with that for the greater Southern California Bight; there was no evidence for greater production inshore. Hewitt reported that the spawning cycle and survival of young anchovy in the nearshore region reflected that occurring throughout the Southern California Bight.



Oceanic Fisheries Resources Division

CAST System Tested

Staff of the assessment program conducted 4 days of experimental verification of the Computer-Assisted-Sighting-Technology (CAST) system aboard the R/V David Starr Jordan. CAST employs two sets of high-powered binoculars linked to a computer system, and was designed to improve the accuracy of marine mammal population surveys conducted in the eastern tropical Pacific.

Directed by Dr. Rennie Holt, Operations Research Analyst, researchers used the CAST system to collect data on the position of buoys and other fixed and moving objects, as baseline information to aid in interpreting actual marine mammal census data.

TUNA AND BILLFISH RESOURCES PROGRAM

Status of Atlantic Tuna Fishery Sampling Program

During the period January 1 to September 30, 1982, catches from three foreign tuna purse seiners fishing in the Atlantic Ocean were sampled in Puerto Rico. Seven size composition samples were collected for the SWFC by Inter-American Tropical Tuna Commission personnel through a contract. The sampling distribution by species is as follows:

Species	# Vessels sampled	# of samples	# of fish sampled
Yellowfin	3	5	182
Skipjack	2	2	75
Bigeye	0	0	0

Foreign-caught Atlantic tunas, transshipped to Puerto Rico, are sampled routinely for biological information by biological technician Eugene Holzapfel, who is stationed in Mayaguez. Data on fork length, weight and species composition of catches are collected. Results of Holzapfel's sampling during the period January 1 to September 30, 1982, are as follows:

Species	Gear	# of samples	# of fish sampled	Tonnage sampled (MT)
Yellowfin	Baitboat	7	644	87.10
	Purse Seine	18	1394	2142.54

	Unknown	6	447	374.33
Skipjack	Baitboat	8	303	2063.08
	Purse Seine	9	449	5486.24
	Unknown	4	203	1932.21
Bigeye	Baitboat	1	30	2.10
	Purse Seine	10	450	1437.09
	Unknown	3	85	314.27
Albacore	Longline	1	50	337.55

North Pacific Albacore Data Base Prepared

Fishery biologist Earl Weber reports that a data base for the north Pacific albacore simulation model has been created. This data base consists of age, area and gear-specific monthly catches estimated from observed fishery data and provides a basis for comparing the predicted catches of the simulation model with the actual catch data through the generation of an R^2 goodness-of-fit index. In addition, the data base facilitates the estimation of parameters used in data sets that are input to the simulation model.

The creation of this data base was accomplished through the development of a software library designed to process historic albacore data into configurations useful to the modeling project. This library consists of computer programs written or modified by E. Weber, A. Coan, Mathematician, and B.H. Megreg, University of Washington.

Striped Marlin Tracked for 24 Hours Near San Diego

The first extended tracking of a striped marlin, Tetrapturus audax was conducted by fishery biologists Dave Holts and Earl Weber on September 21; the fish was tagged with a depth sensitive ultra-sonic transmitter and tracked for 24 hours. The experiment is part of a study aimed at gaining an understanding of the daily horizontal and vertical movement patterns of the striped marlin, swordfish (Xiphias gladius) and thresher shark (Alopias uulpinus). By identifying differences in the daily activity profiles of these pelagic species, the research may assist in resolving conflicts between local sportsmen and the swordfish/thresher shark gillnet fishery. The biologists hope to obtain up to five, 24 hour tracks of each of the species involved.

The marlin was caught and tagged at the edge of a small bank, 28 miles southwest of Point Loma, San Diego. From there it swam north and northwest for 7 hours at about 1.3 knots. The fish then remained fairly immobile, moving only 3 miles in the next 7-hour period between 7:00 p.m. and 2:00 a.m. Between 2:00 a.m. and noon, it moved generally west across deep water to another bank, averaging about 1.7 knots. Its westerly direction of travel was generally "up swell" and into the wind. Tailing "down swell" and basking ("sleeping") behaviors were expected but not observed.

The depth-of-swim profile indicated that the fish stayed at or above 10 m for most of the 24-hour tracking period. At the start of the tracking period the bottom of the mixed oxygen layer was at 12 m. The marlin made only five excursions below 30 m, four of which were between midnight and 5:00 a.m. The deepest was to 74 m just after 3:00 a.m. Tracking was terminated after the 24-hour period.

Richard Johnson, owner and operator of the tracking vessel, Marie B, volunteered his time and services for the marlin portion of the study. By the end of September, 14 fishing trips to local marlin waters were completed with two marlin successfully tagged. The first tagged marlin was lost after 15 minutes. This is generally considered a poor year for the striped marlin catch; to date, less than 200 have been landed at the San Diego Marlin Club. Normally by this time of year an average of about 360 striped marlin have been landed.

Pacific International Billfish Angler Survey - 1981 Results

Pacific International Billfish Angler Survey results for 1981 have been tabulated and fishery research biologist Jim Squire reports substantial changes in catch per angler day have occurred in some of the major fishing areas. Since 1969 the Billfish Angler Survey has been conducted annually in cooperation with the International Game Fish Association. Billfish anglers are requested to complete a postcard form indicating catches and amount of effort expended.

Interest in the trend of billfish catch rates in the Pacific, resulting from data collected by the Billfish Angler Survey, has been growing. The declining trends in catch rate for species such as striped marlin and black marlin have concerned many anglers. In some areas of the Pacific, regulations have been instituted in an attempt to reverse these trends, and the angler survey may provide data relative to the future effects of such regulations.

The 1981 billfish angler survey resulted in data for 11,123 angler days and a total catch of 4,465 billfish (striped, blue and black marlin, Pacific sailfish and shortbilled spearfish). In 1980, a total of 14,943 angler days were reported with a corresponding catch of 5,905 billfish. The 1981 survey response base decreased by 3,820 angler days and the reported number of billfish caught was down by 1,440 fish from 1980.

The Pacific-wide billfish catch rate for 1981 was 0.40 billfish per angler day, or 2.49 days per billfish, unchanged from 1980. Billfish anglers reported a large catch of striped marlin off southern California in 1981, as reflected by a substantial increase in southern California striped marlin catch rates: 0.17 fish per day or 5.58 days per fish in 1981, compared to the long term average of 0.10 fish per day or 10 days per fish.

Striped marlin catch rates decreased for Baja California Sur, Mexico, from 0.69 fish per day in 1980 to 0.51 fish per day in 1981. Blue marlin catch rates increased slightly in the Hawaii region, while black marlin catch

rates declined from a 1980 rate of 0.54 fish per day (1.86 days/fish) to 0.43 fish per day (2.34 days/fish) in 1981.

MARINE MAMMAL BIOLOGY PROGRAM

Preliminary Age Analysis Completed on Spotted Dolphin Kill Samples; Vital-rates Studies Underway

Dr. Al Myrick, Leader, and Aleta Hohn, Zoologist, of the Marine Mammal Age Determination Project, report that preliminary evaluations of the age data for randomized samples from the 1973-1978 kill of male and female spotted dolphins were completed this month.

The evaluations reveal that the average age at sexual maturity for females is approximately 12 years, and the average age of first pregnancy is 13 years. Maximum age of females is 40 or more years; for males it is 37 years. Testis weight begins to increase at approximately 12 years and the average age at male sexual maturity is 14 years. There was no indication that sexual senescence occurred in either sex within the samples analyzed. The oldest pregnant female was approximately 32 years of age and the oldest male in apparent reproductive condition, based on testis weight, was 37 years old.

The frequency distributions by age class for females in the samples, plotted by year of kill, showed a significant depression between the ages of 5 and 13 years. The oldest age class (13) in which the depression occurs corresponds approximately with the age at sexual maturity (12) for females. No similar depression is exhibited in the frequency distributions plotted for males. One possible explanation for the apparent disparity is that sexually immature females might segregate from adult herds. Investigations of this and other hypotheses are underway.

Analyses of the data samples by area and year of kill continue. Preliminary work has been initiated on age-specific pregnancy, reproduction and growth, and year-specific age composition.

Tooth preparation is progressing on approximately 350 females killed during 1981. The age data from this sample will be analyzed with reference to the results obtained from the 1973-1978 female kill samples. If the results of the 1981 spotted female dolphin age distribution is similar to that for 1973-1978, plans are to then shift the emphasis to analysis of spinner dolphins.

Procedure Developed to Monitor Pinnipeds at Channel Islands

The trend in populations of pinnipeds that occupy the Channel Islands National Park off the southern California coast is of joint interest to the National Park Service, Marine Sanctuaries Program (MSP), and National Marine

Fisheries Service. Five species of pinnipeds are known to breed there: California sea lions, northern fur seals, northern elephant seals, northern sea lions, and harbor seals. Guadalupe fur seals are observed to haul out at San Miguel, but have not been observed to pup there recently. The annual pup production at San Miguel Island is over 8,000 California sea lions, 6,000 elephant seals, 1,100 northern fur seals and 150 harbor seals. Obviously, the Channel Islands National Park provides critical habitat for pinnipeds. It is also a key tourist attraction and is located in close proximity to a number of BLM oil lease areas and active wells. With this in mind, the Marine Sanctuaries Program contracted with the National Marine Fisheries Service to develop a pinniped monitoring regime for the sanctuary and park.

In FY 82, counts of pups based on high resolution photogrammetry were compared with ground counts and with counts made from 35 mm imagery. The results of this study are still being evaluated, but a preliminary manuscript on how to monitor pinnipeds is being developed jointly by the Southwest Fisheries Center (SWFC), the National Marine Mammal Laboratory and Hubbs/Sea World Research Institute. A combination of techniques will be recommended. Of key importance is the timing of counts and determining what segment of the population best indexes the trends in the total population.

Pup counts are recommended for elephant seals, fur seals and sea lions. For harbor seals, aerial counts of hauled animals with partial ground truthing seems to be the best method to use. At places like San Miguel Island, ground counts can be integrated into existing research activities (tag resights, behavioral studies, etc.) whereas, at some of the islands, aerial surveys seem to provide the best information. A cost comparison of all of the techniques will be included in the report. The MSP will contract the SWFC to initiate the first year of this monitoring regime in FY 1983.

SWFC Scientist Visits Soviet Union

Dr. William F. Perrin, Supervisory Fishery Biologist, was in the Soviet Union as a guest of the USSR Academy of Sciences (NAUK), August 29 to September 12. The working visit followed the 3rd International Theriological [Mammalogical] Congress in Helsinki, Finland, which was attended by Perrin and wildlife biologist Dr. Al Myrick.

Perrin spent 2 days at the Zoological Institute, Leningrad, working with Dr. A.S. Sokolov on a joint study of morphological adaptations of tropical dolphins. The balance of the visit was spent at the Kozlov Institute of Developmental Biology in Moscow, where Perrin worked with Professor A.V. Yablokov and Dr. M.V. Mina on a joint project begun during Yablokov's visit to the Southwest Fisheries Center in January. The project involves investigation of the use of non-metric skull data to examine subspecific differentiation in tropical dolphins. Perrin, Yablokov, and Mina analyzed a body of data and completed the first draft of a paper that will be reviewed, revised and possibly submitted for publication in the Zoological Journal. Plans are to continue the joint research, possibly with a visit to the Southwest Fisheries Center by Mina in late 1983.

Jennings Presents Paper at Oceans '82 Conference

Jacqueline G. Jennings, Fishery Biologist, attended the Oceans '82 Conference in Washington, D.C., from September 20-22. The Conference was sponsored by the Institute of Electrical and Electronics Engineers' (IEEE) Council of Oceanic Engineers and the Marine Technology Society (MTS). The theme of the conference was "Government, Industry, and Academia - Partners in Ocean Progress." Jennings presented a paper entitled "Tracking Marine Mammals by Satellite; Status and Technical Needs" which was specifically directed at the engineering community and designed to indicate to private industry that a market exists for suitable small animal satellite transmitters.

The presentation detailed the design of the National Marine Fisheries Service's final prototype NIMBUS-6 dolphin transmitter and indicated the technical changes needed to improve the pack for application to dolphins, as well as to satisfy needs of other marine and terrestrial animal tracking programs. Examples of improvements recommended by Jennings included:

(1) Conversion to the ARGOS system, which will be advantageous because the signal required for position determination is shorter that that of NIMBUS-6 (360 ms versus 980 ms). The shorter signal will reduce the power drain, thereby lengthening the life of the radio pack and, in the case of the dolphin pack, will eliminate the need for an antenna pedestal, thereby reducing the hydrodynamic drag of the radio pack on the dolphin's fin.

(2) Incorporation of microprocessors preprogrammed to the appropriate orbits so that the duty cycle (power drain) would be significantly reduced. For example, the unit would be turned on for 20 minutes daily instead of the current "on" time of 4 hours.

(3) Overall reduction in the size of the pack to make long term wear by the animals possible. Since the batteries' bulk largely dictates the size of the pack, improving the overall efficiency of the system would make possible reductions in overall package size.

With the availabilty of the ARGOS system and technological advances being made by NASA and private industry, the future of animal tracking by satellite appears very promising.

TIBURON LABORATORY

FISH COMMUNITIES INVESTIGATION

Impact of Weak Coastal Upwelling Investigated

An unusually weak coastal upwelling which occurred in early summer along the coast of Mendocino, California, had widespread effects on fish communities in northern California. The staff of the Fish Communities Investigation group has been studying the impact of the phenomenon.

The unusual nearshore occurrence of large schools of juvenile shortbelly rockfish (Sebastes jordani), which normally are offshore, was noted as far south as Monterey. This occurrence of shortbellies, a major prey of large coastal predators, was related to the similarly unusual occurrence along the beaches at this time of king salmon (Oncorhynchus tshawytscha).

Nearshore fishing for king salmon became extremely intense during early July, as exemplified by the newspaper report of over 100 per day being caught from the pier at Pacifica, south of San Francisco. The condition lasted several weeks, but by late July a more typical summer mode had returned. Nevertheless, salmon fishing farther offshore continued at levels exceeding those of recent years.

There are important management implications in these events. Its unusual occurrence nearshore put the king salmon within range of greatly increased numbers of anglers. The impact of this sharply intensified fishing pressure on the spawning population remains to be determined, but it could be significant. That patterns of fishing pressure vary with oceanographic conditions underscores the importance of flexibility in management plans so that the manager can respond immediately to such change.

Shortbelly Rockfish Cruise Completed

The last scheduled shortbelly rockfish cruise of the NOAA research vessel David Starr Jordan was completed this month at the routinely sampled study site near Ascension Submarine Canyon (36°00'N, 122°25'W), west of Ano Nuevo Island, California. Cruise leader Susan Smith, Fishery Biologist with the Predator/Prey Task, reports that they were unable to locate large aggregations of shortbelly rockfish, which have been known to occur in the study area at this time during previous years. Only minimum collections of day/night gut samples were obtained. The SIMRAD EK400 echosounder was inoperable during the entire cruise, evidently the result of a power surge just prior to the cruise. Subsequently, all fish scouting and monitoring was done with the new SIMRAD EF802.

In addition to the regular stratified and oblique plankton series, two deep stratified tows were made during the day within the canyon to determine presence or absence of euphausiids. Dominant species in the 17 midwater trawl catches included Merluccius productus, Sebastes goodei, S. crameri, S. paucispinus, Raja spp., and miscellaneous flatfish.

Preliminary results of the shortbelly feeding study will be presented at the CalCOFI Conference in October.

Leopard Shark Age Validation Study

During September, Susan Smith, Fishery Biologist with the Predator/Prey Task, met with Dr. Greg Cailliet and graduate students from Moss Landing, California, Laboratories to discuss and compare techniques and results of their respective studies on age verification and ageing of elasmobranchs. Ms. Smith, who has been working with recaptures of field-tagged and tetracycline-injected Triakis semifasciata, has been using a resin-embedding technique to prepare vertebral centra for ageing. Examination of tetracycline "time marks" on these centra indicate that the calcified centrum rings are laid down annually. Moss Landing, on the other hand, has been using the silver nitrate technique to elucidate centrum rings for this species. Independent readings of rings on vertebral centra from the same specimens using silver nitrate (Moss Landing) and resin-embedding and cross sectioning (Tiburon) resulted in higher ring counts using the latter method. After re-examining the resin-embedded vertebrae, it was decided to rework some of the Moss Landing vertebrae using the resin method, which seems to be more effective in elucidating centrum rings, especially in older fish.

PHYSIOLOGICAL ECOLOGY INVESTIGATION

Presentations Made at AFS Striped Bass Symposium

Dr. Jeannette Whipple, Investigation Leader, and Mickey Eldridge, Fishery Biologist, attended the 112th Annual Meeting of the American Fisheries Society at Hilton Head Island, South Carolina, September 22-25. Also attending with Whipple and Eldridge was Don Stevens of the California Department of Fish and Game, who gave a presentation on the "Striped bass populations of the West Coast of the United States: a perspective of the past and future". Dr. Whipple spoke on "Impacts of pollutants on striped bass in the San Francisco Bay-Delta, California". Both presentations were a part of the symposium, "Striped bass: Environmental risks in fresh and salt water" held on September 24. The meeting was extremely beneficial, particularly in updating the understanding of striped bass research in all areas, according to Dr. Whipple.

Eldridge and Whipple also visited the National Marine Fisheries Service's Charleston Laboratory, where they gave short presentations on the pollutant

work at Tiburon Laboratory and were given a tour of the laboratory facilities by Dr. Lowell Sick.

Effects of Benzene on Blood Studied

Young adult striped bass were exposed for 21 days to two sublethal concentrations of benzene, to determine effects on blood parameters. Samples will be analyzed to determine changes in serum proteins and lipoproteins; plasma glucose, lactate, corticosteroids, proteins and triglycerides; changes in differential blood cell distribution, hematocrit and hemoglobin concentrations; and histological changes in gill, gonad, liver, spleen and adrenal tissues.

UNDERUTILIZED FISHERY RESOURCES

Experimental Fishing and Product Testing Carried Out on David Starr Jordan

Bill Leet, Frank Jacques, Sus Kato, and Cooperator Jean Lestenguet participated in the David Starr Jordan cruise DS-82-07(157). All were aboard during Leg 2, and Kato also participated on Leg 1. During the first leg, six strings of traps of various design were set on anchored longlines, to determine fishing efficiency in catching certain species of fish, crab and shrimp.

Thirty traps were set in 60-500 fm depths near Ascension Canyon, west of Ano Nuevo Island, California. The traps were retrieved on September 6 after soaking for 4-7 days. Two strings were lost due to unknown causes. The catch included 25 Tanner crab (17 were tiny juveniles); 90 lbs of sablefish; 12 spot prawn, 23 sanddabs, 95 whelks (Buccinidae) and several miscellaneous species, including two rock crabs caught in 60 fm.

One bottom trawl tow and a midwater tow were made to collect market samples of fish. The midwater tow caught mostly small shortbelly rockfish (150 lbs) with only 5 fish in the by-catch. The bottom tow provided a variety of fishes including white croaker, flatfish, rockfish, herring, smelt and squid. Shortbelly rockfish and white croaker were headed and gutted, and passed through a deboning machine. The minced meat was washed in cold fresh water, squeezed dry, and stored in the chill room. Samples of sanddab, rex sole, greenstripe rockfish, and shortbelly rockfish were frozen in cardboard containers.

Sampling for euphausiids was carried out with a Tucker trawl. Echo meter marks indicated the likely presence of euphausiids at depths of 10 to 15 fm. Tows of 15 min duration were made over Monterey Canyon at 2300 and 2330 hr at depths of 10 and 15 fm. Each produced a good volume of catch of nearly 100%

euphausiids. Euphausia pacifica was the dominant species (65 and 79% of the catch). Other species of euphausiids included Thysanoessa spinifera and Nyctiphanes simplex.

After the cruise, crab, fish and minced meat samples were sent to various potential users. Tanner crab was judged excellent in flavor and color, but the lack of body meat was a drawback. The size was acceptable, but a little larger size (around 6 inch carapace width) is preferred. The whelk from this area is quite similar in size and appearance to a commercial species in Japan, and initial reaction by Japanese traders was good. Minor complaints were received, however, about the small amount of meat, and the presence of sand in the intestines.

Local Fisheries Development Projects Continue

Fishery biologist Bill Leet spent 2 days in Santa Barbara where he obtained records of the beam trawl fishing trials conducted earlier in the year. Although the beam trawl proved successful in harvesting sea cucumbers, Gordon Cota, the fisherman who was testing the gear has temporarily terminated his trials to engage in another fishery. He is using a different vessel now which will require modifications to accommodate further use of the beam trawl.

Leet also talked to Sea Grant Marine Advisor John Richards and processor Dana Duncan of the Flying Fish Company. The latter is doing experimental work with basking shark liver. Richards provided an overview of current fishing conditions and activities in the area.

The squid sorting experiment of the Fisheries Development Investigation Group continues, but is being hampered by the inconsistent catch in Monterey. Two potential buyers in Japan have shown high interest in buying boiled female Loligo opalescens. Besides the attraction of having egg-filled squid, the buyers favor the idea of importing cooked squid because it is exempt from import quotas (unlike unprocessed squid).

Due to depressed conditions in the tuna industry the Fisheries Development staff received many inquiries from albacore fishermen this month regarding alternative fisheries. Most were interested in trap fishing for spot prawns in central and southern California. The staff advised the fishermen about gear construction and distribution of spot prawn, and loaned some of the Laboratory's traps to a fisherman from Avila Beach for trial fishing. The staff will also work with other fishermen in San Diego, Morro Bay, Bodega Bay and Fort Bragg, California.

PACIFIC ENVIRONMENTAL GROUP

OCEAN CLIMATOLOGY AND MONITORING

Ocean Monitoring Paper Presented

Oceanographer Dr. Douglas R. McLain presented a paper entitled "Ocean Monitoring in Support of Fisheries Research and Management," at the Oceans '82 Conference in Washington, D.C. this month. The paper was published in the conference proceedings. Monitoring of ocean conditions is necessary to understand naturally occurring ocean fluctuations and to be able to separate their effects from those of man, such as by fisheries or marine pollutions. Ocean monitoring on three scales of temporal and spatial resolution is desirable: 1) global, long term annual and monthly mean data for planning surveys and for understanding distributions of populations, 2) regional, monthly data to understand and predict annual recruitment and catches, and 3) mesoscale, daily data for research on biological processes and as tactical support for fish vessels.

Due to their high costs of operation, monitoring is no longer feasible with research vessels and several present monitoring programs, that are based on research vessels are being phased out. Continued monitoring is necessary, however, and is possible using a mix of surface weather and XBT observations from ships of opportunity, tide gauge data, observations from moored and drifting buoys, and remote sensing images from satellites. The present data collection program from these diverse sources is not integrated in any systematic way, and learning how to merge the data from the diverse sources to form more coherent descriptions of ocean fluctuations is a major problem. The paper describes the various data sources, problems associated with them, and several opportunities for improvement.

FISHERIES INFORMATION SYSTEMS AND AUTOMATIC DATA PROCESSING

PACFIN Update

The Pacific Coast Fisheries Data Committee met on September 1, 1982 in San Francisco, California, to discuss the Pacific Fishery Information Network (PACFIN) Project. The Committee consists of representatives from the Alaska Department of Fish and Game, California Department of Fish and Game, Idaho Department of Fish and Game, Oregon Department of Fish and Wildlife, Washington Department of Fisheries, Washington Department of Game, North Pacific Fishery Management Council, Pacific Fishery Management Council, Pacific Marine Fisheries Commission, Alaska Region, Northwest and Alaska Fisheries Center (NWAFC), Northwest Region, Southwest Fisheries Center (SWFC) and Southwest Region. John Carr, SWFC Deputy Director and Fred Kellenberger, SWFC Data Systems Manager attended the meeting.

The committee decided that the Pacific Fishery Information Network will consist of two major projects: 1) the Fishery Management Information System (FMIS) and 2) the Fishery Research Information System (FRIS).

The purpose of FMIS is to provide information to fishery managers on groundfish and salmon. Presently, reports on these fisheries are sent to fisheries managers by the FMIS. Summarized fishery landing data, by port and month, are transmitted to the NWAFC for the merging of the data and the generation of monthly and yearly reports.

The purpose of the FRIS is to provide detailed biological and socio-economic fishery data in order to support economic monitoring, assessment and research on West Coast commercial fisheries. FRIS will contribute to the analysis of multi-species fishing operations, modeling of fishery effort shifts among geographic areas, and special studies of sub-elements of the fishing fleet such as midwater trawl or combination salmon/albacore trollers. Presently, 1974-1976 detail landing and vessel data for the states of California, Oregon, and Washington are in a data base for access by researchers at the SWFC. Plans are now being developed to place 1981 landings receipt (fish ticket) data concerning time, port, species and quantity of landings plus gear code, vessel identification, vessel characteristics, and vessel price in a format similar to the 1974-1976 data base. The system is being developed and implemented by fisheries economist Dan Huppert and computer systems programmer Susan Iacometti of the Southwest Fisheries Center.

WPACFIN Update

David C. Hamm, Program Manager for the Western Pacific Fishery Information Network (WPACFIN) traveled to Guam and Saipan to meet with and provide computer training to personnel of the Guam Division of Aquatic and Wildlife Resources and the Commonwealth of the Northern Mariana Islands, Department of Natural Resources and its Division of Fish and Wildlife. The

training went very well, and the meetings were very productive in planning for continued implementation of WPACFIN. The level of cooperation and coordination was very high in both agencies, and the personnel of these island agencies are enthusiastic about the continued success of the project.

A contract was awarded to CIC, Inc. of San Diego, California, to study the Guam Division of Aquatic and Wildlife Resources' data collection system in an effort to establish a more statistically sound sampling strategy. Improvements in the Division's system will make it possible for them to better support their own data needs as well as those of the National Marine Fisheries Service and the Western Regional Fisheries Management Council. A contract was also awarded to Mohawk Data Sciences of Los Angeles, California, for the purchase of key-to-disk data entry hardware. The system ordered has two entry stations, an 8-inch floppy disk, a 5-Mb hard disk, and excellent communications capabilities. This system will be installed at the Honolulu Laboratory and will greatly improve data entry and edit capabilities of the Laboratory.

Data Entry Machine Acquired

Dorothy Roll, Systems Analyst, reports that the TAB 700 key-to-diskette data entry machine has been delivered and installed in the ADP Operations area. Ms. Ferron, customer representative from TAB Products Co., is training Ruth Toles, the key operator, on the use of the unit. Robert Nydam, Computer Programmer Analyst, is resolving the communication link for data transfer from the TAB 700 to UCSD's VAX system. For technical assistance he is consulting UCSD's communication engineers and TAB Products Co.'s customer engineer.

NWAFC Provides New Software

The Northwest and Alaska Fisheries Center (NWAFC) has provided the Southwest Fisheries Center with the software BITRAN. This program, written and copyrighted by Alan Lindsay of NWAFC, allows the data transfer in alpha mode between microsystems and host computers. There is a version of BITRAN for the Burroughs 7800 and a version for the VAX 11/780. The version on the microsystem receives the text data from either host computers.

Conversion of Financial Reporting System Continues

Robert Nydam continues with the analysis and design for the conversion of the Financial Reporting System (FRS) from ADP Network Services to the VAX/micro-processor system. The logic for the data entry/validation programs on the micro has been completed and the COBOL coding of the program for the entry of commitment data has been started.

Commercial Landings Summary Completed

Susan Iacometti, Computer Systems Programmer, completed the analysis of the 1976 Coastwide Data summaries of commercial landings. She is reconciling

the differences between the data set on the VAX system and the data set recently copied back from the INFONET tape. She will continue this analysis process with the 1974 and 1975 data sets.

New Workshop Technique Utilized at CalCOFI Meeting

In June, computer systems programmer Susan Iacometti was trained by Dr. Aleco Christakis as the program operator of the Interpretive Structural Modeling (ISM) System software, a tool for planning workshops. Iacometti will teach a computer specialist from each of the Divisions how to access and use the ISM system for SWFC's workshops.

The CalCOFI workshop was held in the La Jolla Laboratory on September 21 and 22. It was the first workshop using the ISM method and was led by Dr. Doug DeMaster, a facilitator trained by Dr. Christakis. Cindy Meyers, Computer Programmer in the Coastal Fisheries Resources Division, was selected to be trained during these sessions in the use of the ISM system.

Participants in the CalCOFI Workshop: Dudley Chelton, Jet Propulsion Lab, Cal Tech; Barbara Hickey, Oregon State University; Willard Bascom, SCCWRP; Richard Methot, Southwest Fisheries Center; Richard Klingbeil, California Fish and Game; John McGowan, Scripps Institution of Oceanography; Robin LeBrasseur, Pacific Biological Station, Nanaimo, British Columbia; Greg Cailliet, Moss Landing Marine Laboratories; Alec MacCall, SWFC; Edmund Hobson, Tiburon Laboratory, SWFC; Doug DeMaster, SWFC; Joseph Reid, SIO; Reuben Lasker, SWFC.

MISCELLANEOUS

PUBLIC AFFAIRS

Honolulu Laboratory

Research assistant Jeffrey D. Sampaga and Richard Uchida participated in a 1-day "Handicapable Workforce Conference," sponsored by the State of Hawaii's Commission on the Handicapped. Sampaga and several other "handicapable" people from the community were featured in a slide show which depicted their work and leisure time activities. Sampaga also served as a resource person at the conference.

La Jolla Laboratory

September 29 - James Squire, Fishery Biologist, gave a presentation at the Vagabundos Fiesta of the National Coalition for Marine Conservation on his billfish tagging program.

PRESS RELEASES

Honolulu Laboratory

September 3 - "NOAA Ship Townsend Cromwell completes third Marianas cruise."

La Jolla Laboratory

September 1 - "Biologist Wins NOAA Research Fellowship."

SEMINARS

La Jolla Laboratory

September 7 - Chris Boggs of the Laboratory of Limnology at the University of Wisconsin, Madison, Wisconsin, presented a talk on "The Bio-energetics of Tuna."

14 - Dr. Arthur McEvoy, Assistant Professor of History at Northwestern University in Evanston, Illinois, gave a seminar entitled "Scientists, Entrepreneurs, and the Political Process: Institutional Responses to the California Sardine Failure."

TRAINING

August 31-December 9 - Priscilla Sloan, Biological Technician - "Statistical Methods in Biology," San Diego State University.

September 16 - Virginia Hostler, Administrative Officer - "Fourth Annual Hispanic Heritage Observance," Naval Training Center, San Diego, California.

17 - Virginia Hostler, Administrative Officer - "How to Take Classifiable Fingerprints," Office of Personnel Management, Los Angeles, California.

September 22-December 15 - Earl Weber, Fishery Biologist - "Introduction to CPIM Operating System," UC San Diego, La Jolla, California.

September 27-November 22 - Dave Holts, Fishery Biologist, "FORTRAN Programming," UC San Diego, La Jolla, California.

September 27-October 1 - Frances Begley, Secretary, and Patricia Metcalf, Clerk Typist - "Operator Training on NBI System 3000," NBI, San Diego, California.

September 28-November 30 - Alan Jackson and Randall Smith - Biological Technicians - "Computer Program Design," UC San Diego, La Jolla, California.

- Frank Ralston, Computer Specialist - "On Line Information System," UC San Diego, La Jolla, California.

- Bill Flerx, Fishery Biologist - "Computer Program Design," UC San Diego, La Jolla, California.

MEETINGS AND TRAVEL

Honolulu Laboratory

September 2 - Richard Uchida attended an all-day "Employing a handicapped workforce symposium," sponsored by the State Commission on the Handicapped at the Sheraton-Waikiki Hotel.

9 - Richard Shomura and Mary Lynne Godfrey attended the Combined Federal Campaign kickoff luncheon meeting at the Hale Koa Hotel.

16-28 - Richard Shomura traveled to (1) California to meet with Southwest Region personnel; (2) Washington, D.C., to present a talk at the Marine Technology Society meeting; (3) Hilton Head Island, South Carolina, to attend the American Fisheries Society (AFS) meeting; and (4) Mississippi to meet with NOAA Data Buoy Office personnel at the National Space Technology Laboratory Station.

17-30 - Dr. S. Ralston attended the AFS meeting at Hilton Head Island, South Carolina, where he presented a paper, "A multispecies production analysis of the commercial deepsea handline fishery in Hawaii."

20-21 - Richard Uchida attended a board meeting of the Pacific Tuna Development Foundation in Maui.

30 - R. Shomura presided at the pre- and post-cruise meeting of the Townsend Cromwell (TC-82-01, 82-02, 82-03, 82-04, and 82-05). A special guest at the meeting was Capt. K. William Jeffers, Deputy Director, Pacific Marine Center, Seattle, Washington.

- R. Shomura, R. Uchida, and Dr. Polovina attended a meeting of the Coordinating Council for Research--Northwestern Hawaiian Islands.

La Jolla Laboratory

September 1 - John Carr and Fred Kellenberger traveled to San Francisco, California, to attend a PACFIN meeting.

1 -2 - Dan Huppert traveled to Seattle, Washington, to attend a meeting of the Pacific Coast Fisheries Data Committee and participate on the Source Evaluation Board for Bottom Fish/Shrimp Trawl Economics Contracts.

6 -10 - Reuben Lasker and John Hunter traveled to Miami, Florida, to attend a workshop on Fish Ecology III and present a paper.

14-16 - Jack Brown traveled to Anaheim, California, to attend the Wescon-Western Electronic Show and Convention.

16 - A Computer Technical Users Meeting was held in the auditorium.

16-17 - Virginia Hostler traveled to Los Angeles, California, to attend an OPM training class.

18-20 - Susan Picquelle traveled to Seattle, Washington, to meet with Gary Stauffer to work on the egg production manual.

19-23 - Jacqueline Jennings traveled to Washington, D.C., to present papers at the Oceans '82 Conference.

19-25 - Gary Sakagawa traveled to Hilton Head, South Carolina, to attend a meeting of the American Fisheries Society and convene Marine Fisheries Section meeting.

20-21 - Veronica Breda traveled to Seattle, Washington, to attend a training course on new travel regulations.

21-22 - A CalCOFI Nominal Group Technique Workshop was held in the auditorium.

21-25 - John Hunter traveled to Hilton Head, South Carolina, to attend the American Fisheries Society meeting and present a talk as invited speaker.

- Bob Nydam traveled to Reno, Nevada, to attend a course in Structure Analysis Design sponsored by Control Data Corporation.

26-29 - Izadore Barrett traveled to Portland, Oregon, to attend a Limited Access Workshop and the Pacific Fishery Management Council meeting.

26-30 - Dan Huppert traveled to Portland, Oregon, to attend a Limited Access Workshop and the Pacific Fishery Management Council meeting.

September 27-October 1 - Reuben Lasker traveled to Phoenix, Arizona, to attend a meeting of the PROBES Productivity Workshop.

28 - A Tuna Advisory Committee meeting was held in the auditorium.

28-30 - A Vessel Committee meeting was held in the small conference room.

Tiburon Laboratory

September 13-15 - Director Abramson traveled to Washington, D.C., to attend the Marine Recreational Fishery Statistics meeting.

20-21 - Bill Leet traveled to Santa Barbara, California, to meet with Sea Grant and fishing industry representatives.

21-22 - Ted Hobson traveled to San Diego, California, to attend a CalCOFI planning conference at SWFC.

21-25 - Jeannette Whipple, Maxwell Eldridge and Don Stevens traveled to Hilton Head, South Carolina, to attend the American Fisheries Society meeting and Striped Bass Symposium.

27-28 - Ed Ueber traveled to Portland, Oregon, to attend the Limited Entry Workshop.

Pacific Environmental Group

September 19-24 - Dr. Douglas R. McLain traveled to Washington, D.C., to attend the Oceans '82 meeting and present a paper, to visit the NMFS and NODC staffs in the Page Building and the National Weather Service in Silver Spring concerning XBT programs.

24-25 - Paul N. Sund traveled to Tiburon, California, to confer with Dr. Abbott concerning a co-authored paper.

VISITORS

Honolulu Laboratory

September 2 - Darrell V. Lidwell, Southeast Fisheries Center (SEFC), Miami, Florida, visited Richard Shomura.

7 - Dr. James Parrish, Hawaii Cooperative Fishery Research Unit; Dr. Jack Davidson, UH Sea Grant Program; and Dr. Richard Grigg, Hawaii Institute of Marine Biology, discussed NWHI research with Richard Shomura.

- Dr. Michael King, University of the South Pacific, Suva, Fiji, visited Richard Shomura.

14 - Senator Norman Mizuguchi, Hawaii State Legislature, met with Richard Shomura, Dr. Richard Brill, Randolph K.C. Chang, and Bernard Ito to discuss the Kewalo Research Facility.

16 - Frances Cassidy, Assistant Secretary, Fisheries Division, Department of Primary Industry, Canberra, Australia, visited Richard Shomura.

17 - Dr. H. Shinomiya, Associate Professor, Nihon University, Tokyo, Japan, visited Howard Yoshida.

29 - Eugene L. Nakamura, Director, Panama City Laboratory, SEFC, and former Honolulu Laboratory employee, visited Richard Shomura.

30 - Capt. K. William Jeffers, Deputy Director, Pacific Marine Center, National Ocean Survey, visited and participated in the pre- and post-cruise meetings of the Townsend Cromwell.

La Jolla Laboratory

September 1-30 - Mr. K. Ahn will return to the Center to work with Dr. David Au.

2 - Bill Lowery, U.S. Congress, visited the Laboratory.

3 - Dennis Hagner, Cal State University, Fullerton, visited the Laboratory facilities.

15 - Becky L. Talty, NMFS, Seattle, Washington, met with La Jolla Lab staff members.

22 - Tony Jones, San Diego State University, visited the Laboratory.

September 30-October 1 - Dr. Alexander Christakis, Associate Director, The Center for Interactive Management, University of Virginia, met with Dave Mackett.

30 - Debra Hughes, AT&T, was at the Center to meet with Iz Barrett and Fred Kellenberger.

- LCDR John Stachelhaus and Scott McKellar, National Ocean Survey, Office of Marine Operations, met with Iz Barrett in the afternoon.

Tiburon Laboratory

September 9 - Dan Gotshall, California Department of Fish and Game, Diablo Canyon, California.

10 - Lavern Weber, Oregon State University, Marine Science Center, Newport, Oregon.

- Jateo Izumi, S. Inokuchi, T. Okawa, Tetsuya Kimura, Masaharu Yamauchi and Joshiro Sekine, Shizuoka Prefectural Government, Shizuoha, Japan.

16 - Louis Gurrino, Kai-Vana, San Rafael, California.

- Robert G. Claycomb, Boat Carmen C. Grover City, California.

- Pacific Fishery Management Council (PFMC) Groundfish Team Meeting attended by: Larry Six, PFMC, Portland, Oregon; Charles Korson, NMFS, Terminal Island, California; Jim Golden, Oregon Department Fish & Wildlife, Newport, Oregon; Jack Robinson, Oregon Department Fish & Wildlife, Newport, Oregon; Tom Jow, California Department of Fish & Game, Menlo Park, California; Robert Francis, Northwest and Alaska Fisheries Center, Seattle, Washington; Alan Milliken, Washington Department of Fisheries, University of Washington, Seattle, Washington; Kate King, Northwest Region, NMFS, Seattle, Washington; and Robert Demory, Oregon Department Fish & Wildlife, Newport, Oregon.

Pacific Environmental Group

September 7-10 - Mohammed Rami, Office National de Peches, Casablanca, Morocco.

PERSONNEL ACTIONS

Honolulu Laboratory

September 20 - Linda A. Barraclough, Biological Aid (Fisheries) Conversion to excepted appointment under the Stay-in-School Program.

La Jolla Laboratory

World Expert on Population Dynamics of Marine Mammals at La Jolla for 3-Months Stay

Dr. K. Radway Allen, an acknowledged world expert on population dynamics of marine mammals, last month joined the Marine Mammal Assessment Group for a 3-month stay as a Senior Research Fellow of the National Research Council. Dr. Allen has been an advisor to the International Whaling Commission (IWC) since 1961, and was invited, along with Drs. Douglas Chapman and Sidney Holt, to form the "Committee of Three", which later evolved into the current IWC Scientific Committee.

A native of Australia, Dr. Allen has also been Chief of the Division of Fisheries and Oceanography of Commonwealth Scientific Industrial Research Organization, Australia, Director of the Freshwater Fisheries Department of New Zealand, and Director of the Pacific Biological Station, Nanaimo, British Columbia. During his tenure at the Southwest Fisheries Center, Dr. Allen will be examining the theoretical properties of back-calculated population dynamics models.

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August 27 - William Watkins, Biological Aid - Termination.

September 3 - Amy Kimball, NOAA Junior Fellow - Leave Without Pay.

- Colleen Coultas, Clerk-Typist - Termination.

6 - Virginia Cass, Fishery Biologist - Change in Schedule.

13 - Lisa Lau, NOAA Junior Fellow - Leave Without Pay.

17 - William Ginty, Biological Technician - Resignation.

19 - Carol Miller, Computer Clerk - Pay Adjustment to Intermittent.

24 - Kathryn McKune, Clerk-Typist - Resignation.

- Ian Domowitz, Economist - Termination.

- M. Ragan Nicholl, Biological Aid - Termination.

- Phil Tarantino, Student Assistant - Resignation.

28 - Richard Kiy, NOAA Junior Fellow - leave Without Pay.

30 - Michael Lichter, Computer Clerk - Termination.

- Lee Inness-Brown, Physical Science Technician - Termination.

- Morgan Busby, Biological Aid - Termination.

- Gary Hunt, Student Assistant - Termination.

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Elaine Sandknop of the Ecology and Taxonomy of Fishes Task in the Coastal Division was selected as the EEO Counselor for this region and spent 2 weeks in Washington, D.C., attending a training session for EEO Counselors.

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Barbara MacCall, Fishery Biologist with the Ecology and Taxonomy of Fishes Task in the Coastal Division went on extended maternity leave from the laboratory.

Federal Women's Program (FWP) Survey Analyzed

Statistician Susan Picquelle who with her colleagues Virginia Hostler, and Jacqueline Jennings serve as the Federal Women's Program Coordinating Committee, summarized the results from the FWP survey she had distributed to the women at the La Jolla Laboratory in August.

The purpose of the survey was to determine which goals the Federal Women's Program should adopt and what activities the FWP should sponsor. The goals most highly rated by the women are (in order of decreasing importance): 1) Equal representation: monitor the representation of women in certain job classifications, in the higher grades and in supervisory positions, and determine if any underrepresentation exists, 2) Equal opportunity in hiring: ensure that women are equally likely to be hired, given their percentage occurrence in the list of top qualified applicants, and 3) Identify barriers: examine forces and situations that may work against a woman as she progresses toward her career goal. The activities that are most desired are: 1) assertiveness training, 2) workshop on confidence building, 3) stress reduction techniques, 4) information on local training opportunities, and 5) seminars on consumer issues. These results and other observations and conclusions are being written up in a report and will be distributed to women at the La Jolla Laboratory and to the management.

Tiburon Laboratory

September 30 - Patrick Guillemot, Biological Aid - Termination.

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